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Performance Oriented Packaging Testing of Mk 592 Mod 0 Container

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13. ABSTRACT *(Maximum 200 words)*

Qualification tests were performed to determine whether the in-service Mk 592 Mod 0 Shipping and Storage Container could be utilized to contain properly dunnaged solid type nazardous materials weighing up to a gross weight of 215 kg (474 pounds). The tests were conducted in accordance with Performance Oriented Packaging (POP) requirements specified by the United Nations Recommendations on the Transportation of Dangerous Goods and the Department of Transportation's Title 49 CFR and the Final Rulings published in the Federal Register, Vol. 55 on 21 Dec 90. The container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

14. SUBJECT TERMS	15. NUMBER OF PAGES
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DODPOPHM/USA/DOD/NADTR91002

PERFORMANCE ORIENTED PACKAGING TESTING OF MK 592 MOD 0 CONTAINER

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1 March 1991

FINAL

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INTRODUCTION

The Mk 592 Mod 0 Container, which contained 474 pounds of inert HARPOON Warhead, had an overall weight of 717 pounds. This Performance Oriented Packaging (POP) test was performed to ascertain whether this standard container (Packing Group II) would meet the requirements as specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9. A base level vibration test per the Department of Transportations 49 CFR Final Rulings (Federal Register, Vol. 55, No. 246) on Performance Oriented Packaging was previously conducted by WPNSTA Earle. This is documented in NWHC Report 7676. Due to unavailability, the number of containers used was less than the number required by the UN Recommendation. This has been approved by The Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

The objective of these tests was to ensure that the sample container could withstand conditions of transportation outlined by the UN requirements. The test is representative of the worse case loading of the Mk 592 Mod 0 Container.

TESTS PERFORMED

1. Stacking Test

This test was performed in accordance with ST/SG/AC.10/1, chapter 9, paragraph 9.7.6. One container was used for this test. The container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a height of 3 meters (including the test sample). A stacked weight of 2,151 pounds was used for this test. The test was performed for 24 hours. After the allowed time, the weight was removed and the containers examined.

2. Drop Test

This test was performed in accordance with ST/SG/AC.10/1, chapter 9, paragraph 9.7.3. One container was used throughout the test. The drops were performed from a height of 4 feet impacting the following surfaces:

a. Flat bottom

b. Flat top

c. Flat on long side

d. Flat on short side

e. One corner

This test was performed at ambient temperature of + 70 ± 20 °F.

PASS/FAIL (UN CRITERIA)

1. Stacking Test (UN CRITERIA)

The criteria for passing the stacking test is outlined in paragraph 9.7.6.3 of ST/SG/AC.10/1 and states the following: "... no test sample should leak. No test sample should show any deterioration which could adversely affect transport safety or any distortion liable to reduce its strength or cause instability in stacks of packages."

2. Drop Test (UN CRITERIA)

The criteria for passing the drop test is outlined in paragraph 9.7.3.5 of ST/SG/AC.10/1 and states the following: "Where a packaging for solids undergoes a drop test and its upper face strikes the target, the test sample passes the test if the entire contents are retained by an inner packaging or inner receptacle; e.g., a plastic bag, even if the closure is no longer sift-proof. A slight discharge from the closure(s) upon impact should not be considered to be a failure of the packaging provided that no further leakage occurs."

TEST RESULTS

1. Stacking Test

Satisfactory.

2. Drop Test

Satisfactory.

DISCUSSION

1. Stacking Test

The container was visibly checked after the 24-hour period was over. There was no leakage, distortion, or deterioration to any of the containers as a result of this test.

2. Drop Test

After each drop, the containers were inspected for any damage which would be a cause for rejection. Final inspection indicated damage was minimal with only minor denting noted. The port side skid broke apart after the corner drop (fwd-port corner); however, no leakage was found. The container remained intact and serviceable on completion of the tests.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6

B. NWHC Report 7676, 30 September 1976, Test and Evaluation of Prototype Container, Mk 592 Mod 0, for HARPOON Warhead and Exercise Sections

C. Performance Oriented Packaging Standards; Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiatives; Final Rule, Federal Register, Vol. 55, No. 246 of December 21, 1990

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TEST DATA SHEET

DATA SHEET:	
Container: Mk 592 Mod 0 Container	
Type: 4B1	**Container P/N or NSN:** NSN 8140-01-087-6689
Specification Number: DL 2643225	**Material:** Aluminum
Capacity: 325.2 kg (717 pounds)	**Dimensions:** 57.25" L x 28.75" W x 30.25" H
Closure (Method/Type): Removable Cover	**Tare Weight:** 99.8 kg (220 pounds)
Additional Description:	
PRODUCT: See table	
Name: See table	**NSN(s):** See table
United Nations Number: See table	
United Nations Packing Group: II	
Physical State (Solid, Liquid, or Gas): Solid	
Vapor Pressure (Liquids Only): N/A **At 50 °C:** N/A **At 55 °C:** N/A	
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A
Amount Per Container: See table	**Flash Point:** N/A
Net Weight: See table	
TEST PRODUCT: Inert HARPOON Warhead	
Name: Simulated Weight	**Physical State:** Solid
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: 1	**Gross Weight:** 215 kg (474 pounds)

TABLE

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Cntr	Weight (kg)
9W68	1336-01-201-3933	Exercise Section	2643225	1.4S	0173	1	222.26
9W69	1336-01-202-4531	Exercise Section	2643225	1.4S	0173	1	222.26
9W70	1336-01-201-3937	Exercise Section	2643225	1.4S	0173	1	222.26
V540	1336-01-110-5581	Warhead Section	2643225	1.1D	0286	1	213.19
V555	1336-01-146-7664	Warhead Section	2643225	1.1D	0286	1	225.44
V556	1336-01-146-7665	Warhead Section	2643225	1.1D	0286	1	225.44
V558	1336-01-186-5966	Warhead Section	2643225	1.1D	0286	1	222.26
V559	1336-01-186-5967	Warhead Section	2643225	1.1D	0286	1	222.26
V550	1336-01-269-1698	Warhead Section	2643225	1.1D	0286	1	222.26

MK 592 MOD 0 CONTAINER

POP MARKING

UN 4B2/Y325/S/90/USA/DOD/NAD